

BAKER RANCH TREE ASSESSMENT REPORT

City of Lake Forest, California

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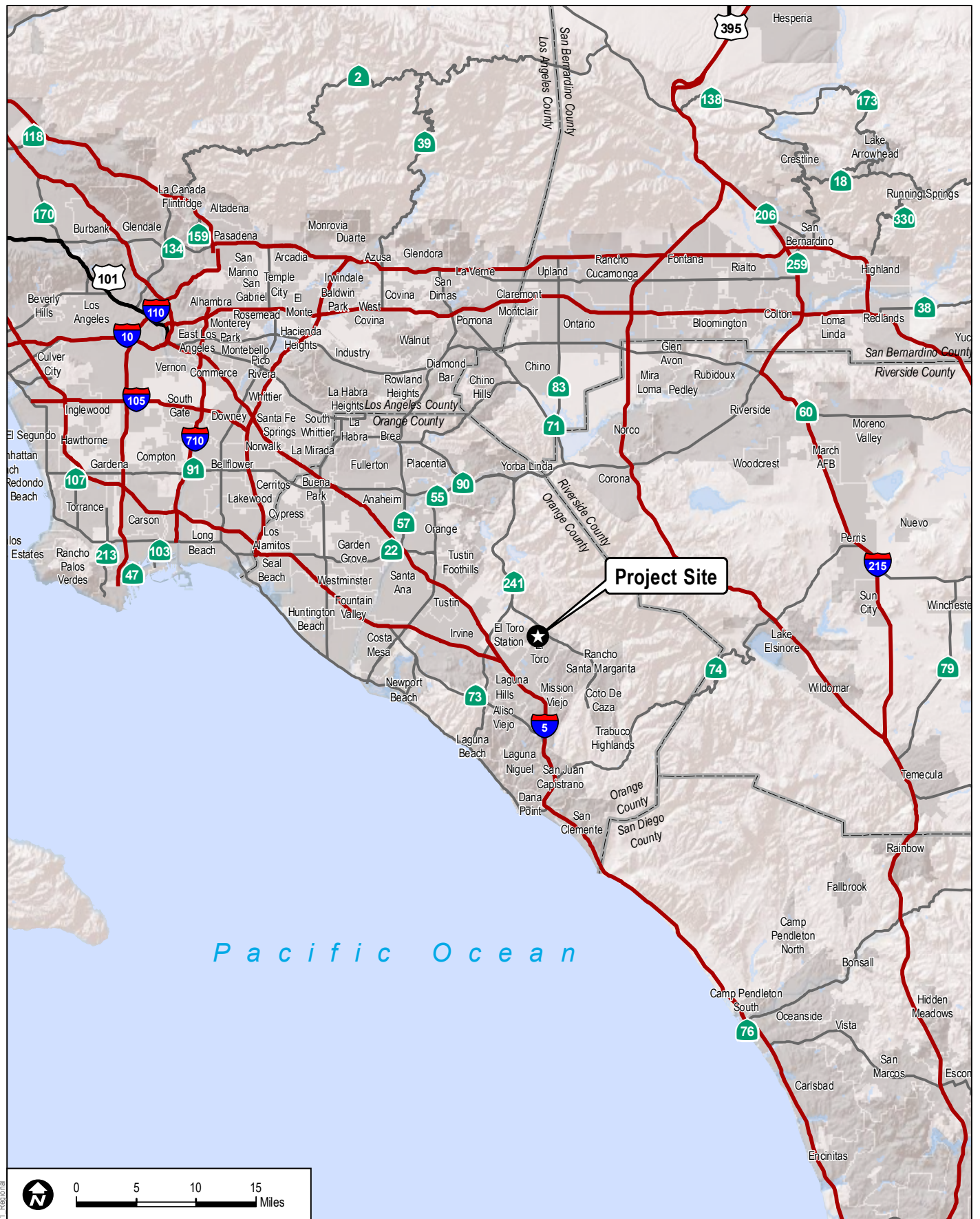
1.0 INTRODUCTION

Dudek was retained by Shea Homes to prepare a Tree Assessment Report for the residential development project known as Baker Ranch in order to satisfy the requirements of the City of Lake Forest Planning Department. Dudek's International Society of Arboriculture (ISA) Certified Arborists performed a complete arborist study including locating, identifying, evaluating, and mapping each native oak tree, and groups of willow, sycamore, and eucalyptus trees on the Baker Ranch property that meet the criteria outlined by the City's planning staff and the City of Lake Forest Eucalyptus Tree Conservation Ordinance (Title 6, Chapter 6.20, City of Lake Forest Code of Ordinances). The Baker Ranch site is proposed for development and, as such, the majority of trees within the property boundary lines are expected to be impacted by construction activities.

This Tree Assessment Report addresses inventory and evaluation of the Baker Ranch site's trees required by the City of Lake Forest. The purpose of this report is to present the physical characteristics, mapped locations, and disposition of the trees and to outline mitigation for impacts to native oak trees.

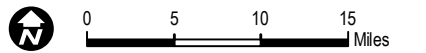
1.1 Project Location and Description

The Baker Ranch project site is located in Orange County and is generally bounded by El Toro Marine Corps Air Station to the northwest, the Foothill Transportation Corridor (SR-241) to the northeast, and Bake Parkway to the south (*Figures 1 & 2*). The project site includes natural/semi-natural, developed, disturbed, orchard, and ornamental nursery growing areas. The orchard areas consist of dead and dying avocado groves, and the developed areas consist of ornamental trees in varying conditions. The tree assessment area includes scattered native oaks, willows, sycamores, and remnants of agricultural eucalyptus windrows. The proposed site improvements include demolition of the existing structures and grading of these areas, as described in associated project planning documents pertaining to the site.



Project Site

P a c i f i c O c e a n



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FIGURE 1
Regional Map

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SOURCE: ESRI World Imagery 2011

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FIGURE 2
Vicinity Map

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2.0 METHODS

Dudek ISA Certified Arborists conducted a field inventory of the Baker Ranch project site on March 2, 2011. Individual tree locations were mapped using a Trimble Pathfinder Pro XH Global Positioning System (GPS) receiver. The Pathfinder has a horizontal accuracy of 1-meter (1-sigma) using differential code positioning techniques. Since tree canopies can sometimes cause loss of satellite lock by blocking the line-of-sight to satellites, an electronic compass and reflectorless electronic distance measuring (EDM) device was also used in mapping tree locations. The EDM/compass combination operates in concert with the Pathfinder system to position offsets, and offset information is automatically attached to the GPS position data string. The electronic tree locations were then post-processed using differential correction procedures within the Trimble GPS Pathfinder Office software package (v. 4.10), and subsequently exported for use in a Geographic Information System (GIS).

An aluminum tag bearing a unique identification number was placed on the trunk of each oak tree within the project site. These numbers correspond to the tree locations presented in the Tree Information Matrix in *Appendix A* and the Tree Location Exhibit in *Appendix B*. Tree trunk diameter measurements presented herein were measured in the field utilizing a diameter tape with units in inches. Measurements of trunk diameter at breast height (DBH) were taken using the protocol outlined in the "Guide for Plant Appraisal," published by the International Society of Arboriculture¹. Consistent with industry standards, trunk DBH measurements for each tree were taken 4.5 feet (54 inches) above natural grade along the trunk axis. Additionally, Dudek calculated composite trunk diameters for multiple stem trees from the data collected in the field. Utilizing International Society of Arboriculture (ISA) standards, the square root of the sum of all squared stem diameters was calculated to ascertain composite trunk diameter values for multiple stem trees. Non-whole number values for composite trunk diameters were rounded to the nearest whole number.

Other tree attribute data collected simultaneously with tree position mapping included: overall tree height, canopy width, overall tree health, and general tree structure. Tree height and canopy measurements are presented in feet. Pursuant to the "Guide for Plant Appraisal," tree health and structure was evaluated with respect to five distinct tree components: roots, trunk, scaffold branches, small branches, and foliage. Each component of the tree was assessed with regard to health factors such as insect, fungal or pathogen damage, mechanical damage, presence of decay, presence of wilted or dead leaves, and presence of wound closures. These factors were considered in assigning individual tree health and structure ratings. Rating values include: *very good*, *good*, *fair*, *poor*, *very poor*, and *dead* with 'good' representing a tree with no observable problems, and 'poor' representing a tree with significant observable disease or damage. Additionally, candidate trees for relocation

¹ International Society of Arboriculture (ISA). 2000. *Guide for Plant Appraisal* (9th Edition).

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were noted where tree and site conditions were favorable. Healthy and structurally sound trees located on level terrain, were considered as prime relocation candidates.

In addition to the individual oak trees located on site, Dudek quantified and evaluated willow stands and eucalyptus stands and agricultural windrows located throughout the site. The boundaries of each stand or windrow were hand-mapped in the field utilizing 200- scale aerial images for the site. Each stand or windrow was assigned a unique polygon ID number which corresponds with the data presented in *Table 3* and the locations presented in *Appendix B*. Data collected for each stand or windrow includes: tree species present, quantity of trees, quantity of dead trees, and general windrow/stand condition. Stand or windrow condition was based on a cursory evaluation of tree health and observable site conditions, including wildfire damage, erosion, or insect/pest infestation.

Following field mapping efforts, individual tree locations and tree windrow/stand polygons were evaluated using ArcGIS software (v. 9.3.1) to determine the position of the trees or windrows/stands related to the proposed project impact area. This GIS analysis allowed for the determination of project-related tree impacts and serves as the basis for the impact/mitigation discussion contained in this report.

2.1 Scope of Work Limitations

No root crown excavations or investigations, or internal probing was performed during the tree assessments. Therefore, the presence or absence of internal decay or other hidden inferiorities in individual trees could not be confirmed. It is recommended that any large tree proposed for preservation or relocation in an urban setting be thoroughly inspected for internal or subterranean decay by a qualified arborist before finalizing preservation or relocation plans.

2.2 Impact Determination

Tree impact status was determined based on spatial analysis of individually mapped tree locations and stand/windrow polygons in relation to the proposed site grading plan provided to Dudek (Adams-Streeter 2011). This evaluation was conducted using ArcGIS software and the tree and stand/windrow location information generated for the project. Any trees or stands/windrows located within the proposed grading limits are considered to be impacted. The impact analysis results were utilized for determining overall tree impacts and associated mitigation calculations for the Baker Ranch project site. The resulting GIS data files were then used in generating the Tree Location Exhibit presented in *Appendix B*.

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3.0 OBSERVATIONS

3.1 Native Oak Trees

One (1) native oak species, coast live oak (*Quercus agrifolia*) is represented on the project site. There are a total of forty eight (48) oak trees with minimum trunk diameter measurements of five (5) inches on the Baker Ranch site. Forty-seven oak trees are located within the proposed project grading limits and are considered impacted. *Table 1* presents the quantity of all oaks on site by height and trunk diameter classifications.

Table 1
Tree Heights and Trunk Diameter Classifications

Tree Height (ft.)			Trunk Diameter (in.)		
Height Range	Quantity	Percentage	Diameter Range	Quantity	Percentage
11 to 15	6	12.5%	5 to 8	18	37.5%
16 to 20	11	22.9%	9 to 12	10	20.8%
21 to 25	20	41.7%	13 to 16	6	12.5%
26 to 30	7	14.5%	17 to 20	6	12.5%
31 to 35	2	4.2%	21 to 24	4	8.3%
36 +	2	4.2%	25 +	4	8.3%
Total:	48	100.0%	Total:	48	100.0%

*Trunk diameter measurements are composite DBH values calculated as the square of the sum of all squared individual trunk diameters.

Many of the site's oaks have more than one trunk. Typical trunk form varies from standard (single trunk) to forked (branching between 2 and 4½ feet) to multi-stemmed (branching below 2 feet). Three areas on the Baker Ranch site have been identified as oak woodlands² and are located along the western edge of the project site, adjacent the Borrego Canyon wash. The first coast live oak woodland (CLOW) area identified as CLOW 1 on the Tree Location Exhibit in *Appendix B* includes a total of 11 individual oak trees. This woodland is adjacent to an existing road and an outwash. The second oak woodland area identified as CLOW 2 on the Tree Location Exhibit in *Appendix B* contains 17 individual oak trees and is located along a northwestern facing slope, bordered by an existing road and drainage. The third oak woodland area identified as CLOW 3 on the Tree Location Exhibit in *Appendix B* contains 1 individual oak tree and is located in the north western corner of the property, bordered by southern willow scrub and a wash on the east and south, and the property boundary on the north. In addition to the 29 individual oak trees contained within CLOW 1, 2, and 3, an additional 19 coast live oak trees are scattered on site, primarily associated with the northwest-facing slopes that abut the Borrego Canyon wash.

² Vegetation mapping data, PCR Services, 2009

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3.2 Oak Tree Health

The most common oak tree defects observed on the Baker Ranch project site include excessive leaning, lopsided canopies, weak branch attachments, damaged bark and branches, and basal and trunk cavities with decay. Most of these defects, however, are common in natural woodland systems. The most common structural concern observed is associated with erosion of soil from the root ball. This is mainly occurring on the steep northwest facing slopes associated with CLOW 2. Despite existing oak maladies on site, the majority of oaks exhibit at least 'fair' health condition ratings, with half (50.0%) exhibiting 'good' health. The trees have typical attributes of native oaks, including cavities with internal wood rot, poor branch structure, and the presence of dead wood. *Table 2* provides a summary of the health ratings for the individual oak trees on the Baker Ranch project site.

Table 2
Oak Tree Health Ratings

Tree Height (ft.)		
Rating	Quantity	Percentage
Good	24	50.0%
Fair	22	45.8%
Poor	2	4.2%
Total:	48	100.0%

3.3 Other Tree Species

In addition to surveying and evaluating individual oak trees, Dudek evaluated stands of native willow or sycamore trees and eucalyptus windrows on the project site. Based on field observations, there are 110 native willow trees (*Salix* spp.) and 5 California sycamore trees (*Platanus racemosa*) located within the three willow stands located on site. Two stands are located adjacent the Borrego Canyon wash along the western edge of the property, while the third stand is located in the southwest corner of the property adjacent a small on-site drainage. Many of the willow trees are multiple stemmed trees and most exhibit good health and vigorous growth. Of the 110 willow and sycamore trees observed in these areas, five (5) are dead.

Dudek documented 1,202 eucalyptus trees within eucalyptus stands and windrows on the project site. The overall condition of the eucalyptus population is poor. The majority of trees show signs of decline and many have died (of the 1,202 total eucalyptus trees, 324 are dead). The decline and death of the eucalyptus trees may be due to several factors including lack of maintenance and extended drought conditions. The few windrows that are in good condition are receiving supplemental water from the adjacent nursery operations on site.

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Table 3 summarizes the non-oak tree resources on the Baker Ranch site, by polygon. The Tree Location Exhibit in *Appendix B* presents locations for each tree stand/windrow, identified by polygon ID.

Table 3
Summary of Other Tree Species

Polygon ID	Type	Tree Species and Quantity	Condition
1	Eucalyptus grove	52 <i>Eucalyptus camaldulensis</i>	Good condition, many small diameter trees (> 5")
2	Eucalyptus grove	48 <i>Eucalyptus camaldulensis</i>	Good condition, many small trees (> 5")
3	Eucalyptus windrow	74 <i>Eucalyptus globulus</i>	Fair condition, windrow contains 28 dead trees
4	Eucalyptus windrow	33 <i>Eucalyptus globulus</i>	Poor condition, fire damage, erosion, windrow contains 8 dead trees
5	Willow stand	45 <i>Willow</i> spp.	Fair condition, fire damage, 5 dead trees in stand
6	Eucalyptus windrow	42 <i>Eucalyptus globulus</i>	Fair condition, fire damage, many trees re-sprouting post fire. Not expected to be removed.
7	Willow stand	30 <i>Willow</i> spp. and 5 <i>Platanus racemosa</i>	Fair condition, 6 down trees are re-sprouting. Not expected to be removed.
8	Eucalyptus windrow	23 <i>Eucalyptus globulus</i>	Poor condition, 7 dead trees in windrow
9	Eucalyptus windrow	38 <i>Eucalyptus globulus</i>	Good condition – some deadwood
10	Eucalyptus windrow	61 <i>Eucalyptus globulus</i>	Fair/Poor condition, 19 dead trees in windrow
11	Eucalyptus windrow	23 <i>Eucalyptus globulus</i>	Good condition, 2 dead trees in windrow
12	Eucalyptus windrow	4 <i>Eucalyptus globulus</i>	Poor condition, 2 dead trees in windrow
13	Eucalyptus windrow	49 <i>Eucalyptus globulus</i>	Fair/Poor condition, 20 dead trees in windrow
14	Eucalyptus windrow	36 <i>Eucalyptus globulus</i>	Poor condition, 30 dead/cut trees in windrow
15	Eucalyptus windrow	74 <i>Eucalyptus globulus</i>	Poor condition, 67 dead/cut trees in windrow
16	Eucalyptus windrow	112 <i>Eucalyptus globulus</i>	Poor condition, 6 dead/cut trees in windrow, some re-sprouting
17	Eucalyptus windrow	56 <i>Eucalyptus globulus</i>	Poor condition, 34 dead trees in windrow
18	Eucalyptus windrow	10 <i>Eucalyptus globulus</i>	Poor condition, 8 dead trees in windrow
19	Eucalyptus windrow	57 <i>Eucalyptus globulus</i>	Good condition, 6 dead trees in windrow
20	Eucalyptus grove	11 <i>Eucalyptus globulus</i>	Good/Fair condition, 3 dead trees in windrow
21	Eucalyptus windrow	306 <i>Eucalyptus globulus</i>	Good/Fair condition, 79 dead trees in windrow
22	Willow stand	35 <i>Willow</i> spp.	Good condition
23	Eucalyptus grove	28 <i>Eucalyptus globulus</i>	Good condition
24	Eucalyptus windrow	65 <i>Eucalyptus globulus</i>	Good condition, 5 dead trees in windrow

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4.0 TREE PRESERVATION

4.1 Jurisdiction and Regulatory Definitions

This section presents a summary of applicable laws and regulations pertaining to tree protection and removal. Currently, the City of Lake Forest only regulates eucalyptus tree cutting or removal activities and provides no requirements for mitigating impacts associated with tree removal.

4.1.1 City of Lake Forest Eucalyptus Tree Cutting Requirements

A Eucalyptus Tree Cutting Permit may be required for potential impacts associated with the Baker Ranch project affecting up to 836 live eucalyptus trees. The permit application is intended to meet the standards set forth by the City of Lake Forest Eucalyptus Tree Conservation Ordinance (Title 6, Chapter 6.20, City of Lake Forest Code of Ordinances). Specifically, the Ordinance is presented to control infestation of the eucalyptus longhorn borer by regulating the maintenance and removal of eucalyptus trees. The Ordinance requires that during the period from April 1st through October 31st of each year (the “restricted period”) a Eucalyptus Tree Cutting Permit is required prior to cutting, pruning or removing any eucalyptus trees. During the restricted period, a permit application must include:

- Site plan indicating the number and location of eucalyptus trees to be pruned or removed on 8½” x 11” size paper with north arrow and title block indicating name, address and date of plan preparation;
- Small scale vicinity map (Thomas Guide)
- Written approval from Homeowner’s or Business Association; and
- Completed Eucalyptus Tree Cutting Permit Application Form

A copy of the Eucalyptus Tree Cutting Permit Application Form is included in *Appendix C*.

4.1.2 Migratory Bird Treaty Act (1918)

The Migratory Bird Treaty Act (MBTA 1918) requires tree pruning or removal activities to occur during certain time periods to avoid harassment of nesting birds. The MBTA is applicable and shall be followed during tree removal operations on site. Biological surveys should be conducted to provide clearance for project initiation.

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4.2 Impacts

Impacts to trees can be classified as either direct or indirect. Direct impacts to trees on construction sites are typically the result of physical injuries or changes caused by machinery involved with the development process. Direct impacts include root damage, soil excavation and compaction, grade changes, loss of canopy, and trunk wounds, amongst others. For the purposes of this Tree Assessment Report, direct impacts are those associated with tree removal (grading). Indirect impacts to trees are the result of changes to the site that may cause tree decline, even when the tree is not directly injured. Large-scale alterations to the area as well as specific changes that occur around the trees are important considerations. Indirect impacts include changes to the overall project site, which affect hydrological conditions, ground water recharge and sub-surface water flow, amongst others.

Impact totals presented herein are based on development plans as of the date of this Tree Assessment Report. Based on the GIS analysis conducted for this report, a total of 47 native coast live oak trees would be subject to direct impacts associated with development. Additionally, there will be 836 live eucalyptus and 75 live willow trees that will be directly impacted by the proposed project. No impacts to sycamore trees are expected as they lie outside proposed project grading limits. A summary of impacted trees by species is presented in *Table 4*.

Table 4
Summary of Impacted Trees

Scientific Name	Common Name	Quantity of Live Trees
Quercus agrifolia	Coast live oak	47
Eucalyptus spp.	Eucalyptus	836
Salix spp.	Willow	75
Platanus racemosa	California sycamore	0
	Total:	958

5.0 OAK MITIGATION

5.1 Mitigation Quantities

Mitigation for impacts to coast live oak trees on the Baker Ranch site is outlined in this section. As no regulations for mitigating oak tree or woodland impacts are currently in place in the City of Lake Forest, the oak mitigation program outline herein draws from the state-level guidelines for counties included in Public Resources Code (PRC) 21083.4.

Mitigation for oak tree impacts associated with the Baker Ranch project includes replacement of removed/impacted trees at a replacement ratio of 2:1, resulting in a total of 94 mitigation oak trees to

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be planted on site. Consistent with PRC 21083.4, all oak trees with minimum trunk diameter measurements of 5 inches are included in the mitigation calculations. Further, oak mitigation for the Baker Ranch site includes provisions for maintenance and monitoring of replacement trees for a period of no less than 7 years, and includes replacement if mortality should occur during that 7 year period. In an effort to maintain minimum mitigation tree quantities, Dudek recommends over-planting mitigation trees by approximately 20%, resulting in a total mitigation planting of 115 oaks. All mitigation oak plantings for the Baker Ranch site shall be coast live oak (*Quercus agrifolia*). Table 5 presents the recommended oak mitigation planting totals by stock size. The goal is to replicate natural oak woodlands by creating a diversity of size and age classes.

Table 5
Mitigation Oak Planting Summary

Coast Live Oak Stock Size	Quantity
Seedling	25
1 gallon	20
5 gallon	20
15 gallon	10
24 inch box	10
36 inch box	10
48 inch box	10
60 inch box	10
Total:	115

Should any impacted oak trees be relocated on-site, the mitigation quantity will be adjusted accordingly. Relocation candidate trees will also be subject to the survival criteria presented herein.

5.2 Oak Planting Locations and Densities

Mitigation oak tree planting on site should be incorporated into the overall project landscape and/or mitigation planting plan. Planting locations should adhere to site-specific constraints, including, but not limited to, fuel modification zone placement, alternate mitigation sites, and easement locations. Designation of mitigation oak tree planting locations should be closely associated with existing woodlands, where possible (e.g. adjacent CLOW 3) or should be located in appropriate geographic locations with similar aspect and slope conditions as the natural woodlands currently on site. Oak trees typically occur in scattered groups with dominant trees flanked by co-dominants, secondary and understory trees. These trees are often within a few feet of each other but are spaced further from neighboring tree groups. As such, the planting of oaks on site should be completed according to

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accepted practices, namely, the trees should be planted in clusters of three to four rather than a uniform grid planting design.

As coast live oak is a shade-tolerant species, higher-density plantings can be accommodated compared to those for other non shade-tolerant oak species, such as valley oak. Dudek recommends a non-uniform or non-grid-type planting layout for all oak planting areas. Specifically, planting locations within the planting areas should mimic natural oak woodland distributions, with tree clusters and openings scattered randomly throughout the planting area. Individual planting locations should be flagged in the field by a qualified forester, arborist, or biologist prior to tree planting efforts. Based on an optimal coast live oak woodland density of 80 trees per acre, the 115 mitigation oaks will require 1.5 acres of planting area within the Baker Ranch property.

5.3 Site and Planting Pit Preparation

All weeds, debris, wood chips, and rocks over 2 inches in diameter should be removed from the planting area to a radius of 3 feet from each planting hole. Additionally, all clods over 1 inch in diameter and all rocks over 2 inches in diameter should be removed from the planting pit. The planting pit should be excavated to a minimum of two times the diameter of the root ball, and to a depth adequate to allow the root ball to rest on firm soil. The sides and bottom of the planting pit should be scarified prior to installation of the tree.

The height of the root ball should be 1 to 2 inches higher than the natural grade of the surrounding soil upon completion of planting. This allows for settling of the tree over time, and prevents the root ball from resting below grade where it is susceptible to moisture, fungal pathogens, and other soil organisms.

5.4 Irrigation

Mitigation oak trees should be supplied with irrigation water during the dry season for a period of 5 years. Irrigation should be supplied from on-site water sources. A drip irrigation system should be employed to water the trees during this time period. Irrigation should be supplied to keep the trees vigorous and encourage healthy growth, typically every 2 weeks throughout the summer. The irrigation schedule should be changed throughout the year to accommodate changing water needs. The irrigation system should be kept off as long as possible during the winter rainy season, unless continued drought results in the need to provide supplemental irrigation.

5.5 Tree Planting

The tree planting pit should be prepared as discussed in Section 5.3. The following recommendations are provided to enhance tree survival.

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Depth. The depth of the planting pit should be checked so that the top of the root ball extends 1 to 2 inches above grade. This can be accomplished by placing the tree, while still in the container, in the planting pit and laying a pole across at the original grade. The top of the root ball should be 1 to 2 inches higher than the original grade level.

Container and roots. Remove the tree from the container and trim the root ball according to the following criteria: Locate any thick circling roots and either straighten them or cut them cleanly. Make three to four vertical cuts 0.5 inch deep around the root ball in order to thin the roots. Spread the bottom roots out, as necessary.

Tree placement and backfilling. Place the tree in the pit, making sure planting depth is appropriate. The native soil should be backfilled into the planting pit. A 4 inch-high soil watering basin should be placed around each oak tree at planting, surrounding the diameter of the planting pit. The trees should be thoroughly watered immediately following planting.

Timing. Trees should be planted in the fall of each year, soon after the first fall rains have moistened the soil. Preferably, containerized trees should be planted by mid-December.

5.6 Tree Identification and Mapping

Following tree planting, each of the mitigation oak trees should be tagged with a tree tag bearing a unique identification number. Because the trees are small, tree tags should be fastened to a tree limb, not the trunk, using wire or plastic ties. Tree tags should not be nailed into any part of the tree. Concurrent with tagging, tag numbers should be recorded, along with general location information (planting area identification number).

Following planting, and concurrent with tagging efforts, oak trees should be mapped using generalized polygons as location identifiers. Polygons representing no more than 25 individual tree locations should be mapped on 100-scale field maps and should reference tree tag number ranges corresponding to the trees contained in that polygon.

The tree mapping and tagging efforts provide an information baseline that will be critical for tracking establishment success and failure for the duration of the monitoring program.

6.0 MAINTENANCE

Focused maintenance efforts are recommended for the oak plantings addressed herein rather than an intensive site-wide method. Maintenance should be targeted only toward providing an appropriate growing environment for the oak plantings and should include an integrated pest management system

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for addressing issues. The following recommendations are provided for properly managing the trees and their growing environment:

- Trees should be pruned back only to remove broken limbs. Otherwise, pruning should not be performed. No more than one-fourth to one-third of leaf area should be removed at any pruning. ISA pruning standards should be followed.
- Fertilization should be performed only if soil analysis results indicate that amendments are required. If required, fertilization should occur twice a year, in March and October. Only a slow-release product should be used. High soil salt levels associated with fertilizer applications can present several problems and must be managed accordingly.
- Removal of weeds and competitive plants is recommended within 4 feet of individual tree planting locations, leaving only bare soil in order to remove existing weeds and to reduce the available weed seed bank in the upper inch or so of soil. Manual removal is recommended twice annually, in spring and late summer, for a period of 2 to 3 years after planting to reduce competition with trees for available soil moisture and nutrients. Chemical control is not recommended.
- Insect or disease outbreaks that threaten the successful establishment of oak trees should be dealt with by addressing the cause of the outbreak. Chemical control may be considered as a last resort, if cultural practices cannot achieve desired results.
- Every year, after winter/spring rains and before irrigation controllers are turned on, the entire irrigation system should be thoroughly evaluated and all damaged equipment repaired or replaced. Irrigation system pressure should be checked and adjusted, if necessary, no more than weekly and no less than monthly, to ensure efficient operation of the irrigation system.
- Observations of frost or storm damage should be noted. If plants exhibit signs of frost damage, affected foliage should not be removed until after the threat of further frost damage has passed. Further, any limbs that have been broken as a result of storm damage should be removed.
- Evidence of erosion should be noted during scheduled monitoring visits. Erosion control methods may be necessary, including sandbagging water run channels or applying erosion controlling mulch or specialized material such as jute netting or Geo-Mesh.

7.0 MONITORING PROGRAM

Tree monitoring will be a critical component for enhancing the overall mitigation success. While necessary for documenting establishment success and quantifying mitigation totals, monitoring is

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also an avenue for early problem detection. Effective monitoring of the oaks discussed in this Plan will facilitate early identification of problems that may lead to failure. Early detection allows immediate correction or examination of problems, thereby minimizing tree mortality, required tree replacement, or progressive impacts incurred by delays in site establishment. Monitoring should be conducted by an ISA-Certified Arborist, Registered Professional Forester (RPF), or qualified biologist with experience in oak woodland restoration.

The following recommended monitoring protocols are provided to guide mitigation oak management efforts as well as to provide a basis for reporting. Reporting should be provided to Shea Homes following all monitoring visits. Additionally, one monitoring report shall be submitted by Shea Homes annually to the City of Lake Forest staff charged with oversight of this Plan.

7.1 Monitoring Schedule

It is recommended that monitoring of mitigation oaks be conducted quarterly. Monitoring should focus on plant health, mortality rates, presence of pests or diseases, competition levels from non-native species, and other factors that may affect establishment or growth of the planted oaks. Monitoring should occur from planting through the 7-year. Monitoring should be conducted by qualified arborists, foresters, or oak restoration specialists with specific oak tree establishment experience. The monitor should be on site during oak planting and irrigation installation periods, and quarterly each year throughout the monitoring period to track the progress of the oak mitigation.

7.2 Establishment Standards

The goal of this pre-mitigation program is to successfully establish container-grown oaks of varying sizes within mitigation areas, consistent with other habitat mitigation priorities identified for the Baker Ranch site. In order for oak mitigation to be achieved, 94 individual mitigation oak trees must survive for a period of 7 years.

7.3 Documentation and Reporting

A key component to the success of the oak mitigation program for the Baker Ranch site will be tracking and documenting tree conditions and quantities. Tree data should be stored in a spreadsheet database and maintained throughout the planting and monitoring period. This database will serve as the overall documentation and tracking device used to manage mitigation efforts, track project success, and quantify mitigation totals to satisfy project requirements. Monitoring visits should focus on identifying tree survival/mortality totals, indicating general health condition and other notable attributes, and identifying any necessary site maintenance.

Baker Ranch Tree Assessment Report Lake Forest, California

Quarterly monitoring reports should be submitted to Shea Homes and will include tree survival/mortality totals, general field observations related to tree health and survivability, and any recommended maintenance.

Annual reports should be submitted to Shea Homes and will include discussions of tree health and mortality, adaptation success of trees on the project site, cultural practices affecting tree health, and overall success of tree establishment on site. The annual report shall be submitted to the City of Lake Forest.

7.4 Observations/Recommendations

Observations made during quarterly monitoring visits should be recorded and included in reports submitted to Shea Homes. Observations should include survival and mortality totals, a commentary on general site conditions, documentation of any pest/disease problems, and other factors associated with tree survival and mortality. Further, any recommendations for corrective actions or maintenance necessary for promoting tree health and survival should be made during the reporting process.

7.5 Success Performance Measures

7.5.1 Mitigation Program

In the event that the monitor determines that baseline standards are not on course for goal achievement, steps to correct the potential failure will be recommended. In the event of potential destructive processes or agents, the monitor will recommend remedial actions. These actions may include:

- Increased monitoring efforts
- Focused insect control
- Weed control
- Tree pruning
- Tree removal
- Development of supplemental irrigation
- Enhancement of soils
- Supplemental planting of acorns or oak seedlings

Baker Ranch Tree Assessment Report Lake Forest, California

- Other measures as needed.

7.5.2 Mitigation Program Success

Upon completion of the 7-year tree establishment period, one final report will be prepared and submitted to Shea Homes and will document final tree survival totals. The final report shall be submitted to the City of Lake Forest and will serve as the final component of the oak mitigation program, releasing Shea Homes from further oak mitigation requirements for the Baker Ranch site.

8.0 CONCLUSIONS

The Baker Ranch project site includes approximately 926 live trees within the project boundary. The tree population on site consists of native and non-native species, including coast live oak, eucalyptus, willow, and California sycamore trees. There are also an unspecified number of dead and declining avocado trees on the property. The project site includes 48 coast live oaks trees with diameters that are 5 inches or more measured at 4.5 feet above natural grade. Forty-seven of these oaks are located within the proposed project grading limits and are considered impacted and are included in the mitigation calculations presented herein.

Based on the oak impact totals and accounting for potential replacement tree mortality, Dudek recommends that 115 coast live oak trees be planted within the Baker Ranch project boundary. The proposed plantings range in size from seedlings to 60-inch box trees in order to replicate the size diversity present in natural oak woodlands. This Tree Assessment Report identifies criteria for suitable oak tree planting locations on site; however, exact oak tree planting areas should be detailed in the project mitigation planting plan or landscape design plan, consistent with site constraints and native oak woodland restoration planting techniques. Mitigation oak monitoring is also a necessary component to this report to ensure that mitigation oaks successfully establish and survive for a period of seven (7) years. Finally, a Eucalyptus Tree Cutting Permit will be required to remove the eucalyptus trees from the property during the period from April 1st through October 31st.

APPENDIX A

Tree Information Matrix

Baker Ranch Tree Assessment Report

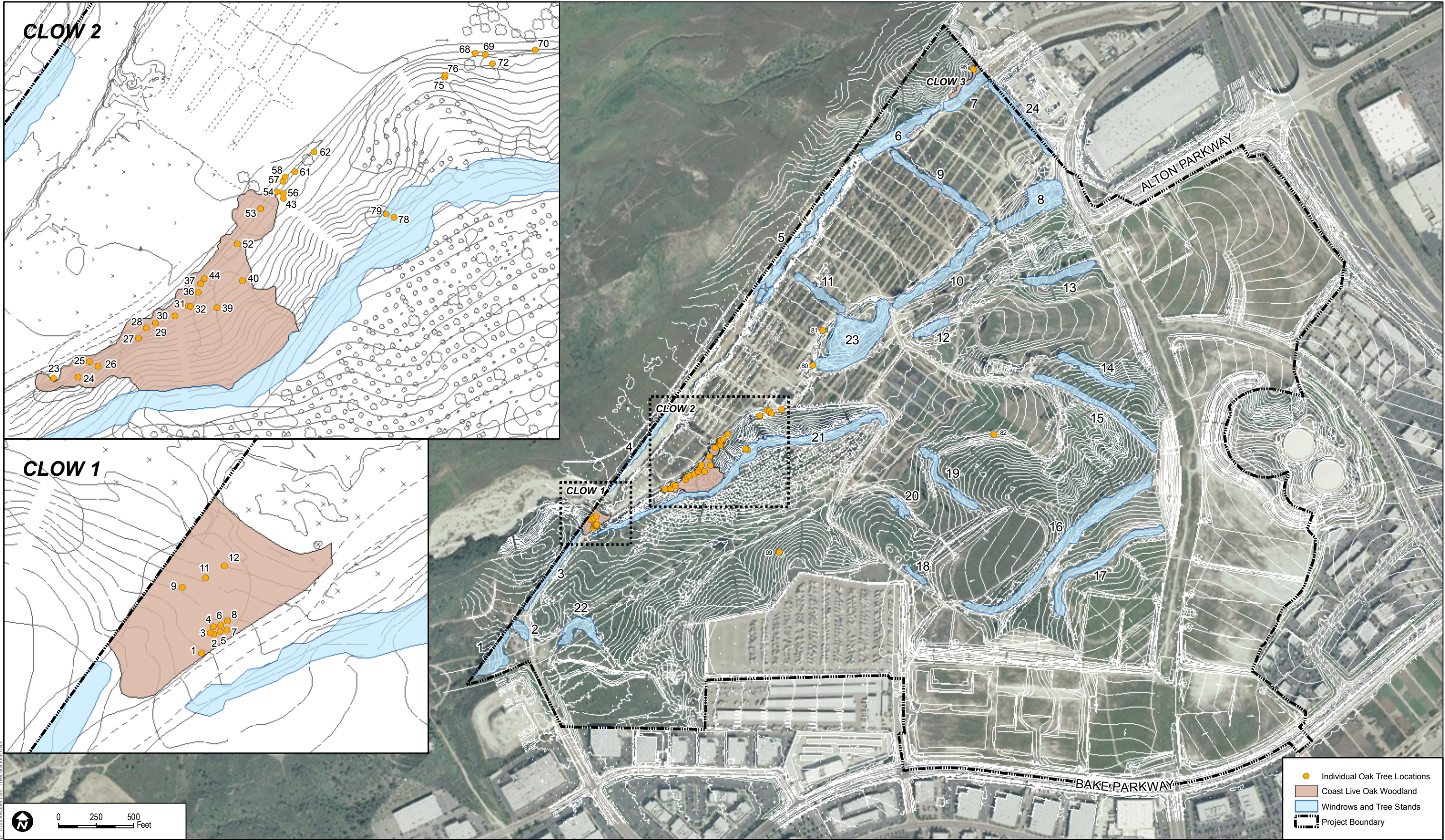
Lake Forest, California

Tree ID #	Species		Number of Individual Stems	Individual Trunk Diameters (inches)								Trunk Diameter (inches)*	Basal Diameter (inches)	Height (feet)	Canopy Spread (feet)	Health	Structure	Relocation Candidate	Comments	Northing	Easting
	Scientific Name	Common Name		1	2	3	4	5	6	7	8										
1	<i>Quercus agrifolia</i>	Coast live oak	7	7	6	5	5	5	4	2		13	26	21	20	fair	fair	No		2191220.744	6123999.877
2	<i>Quercus agrifolia</i>	Coast live oak	3	6	4	2						7	13	20	14	fair	fair	No		2191237.41	6124010.981
3	<i>Quercus agrifolia</i>	Coast live oak	3	6	5	2						8	12	21	15	fair	fair	No		2191238.6	6124007.46
4	<i>Quercus agrifolia</i>	Coast live oak	3	5	1	1						5	6	20	8	fair	fair	No		2191244.248	6124010.356
5	<i>Quercus agrifolia</i>	Coast live oak	2	7	5							9	14	22	20	fair	fair	No		2191240.079	6124016.43
6	<i>Quercus agrifolia</i>	Coast live oak	2	5	2							5	8	20	8	fair	fair	No		2191245.546	6124016.939
7	<i>Quercus agrifolia</i>	Coast live oak	1	5								5	7	18	8	fair	fair	No		2191241.284	6124022.69
8	<i>Quercus agrifolia</i>	Coast live oak	3	9	4	1						10	14	22	16	poor	fair	No		2191249.11	6124022.997
9	<i>Quercus agrifolia</i>	Coast live oak	2	14	12							18	28	25	30	fair	good	Yes		2191278.877	6123983.157
11	<i>Quercus agrifolia</i>	Coast live oak	3	7	6	6						11	17	26	18	good	fair	No		2191287.713	6124003.68
12	<i>Quercus agrifolia</i>	Coast live oak	2	42	25							49	50	35	55	fair	fair	No		2191298.154	6124020.003
23	<i>Quercus agrifolia</i>	Coast live oak	2	13	12							18	19	24	22	fair	fair	No	Erosion, old tag #52	2191480.755	6124474.962
24	<i>Quercus agrifolia</i>	Coast live oak	1	14								14	15	28	25	fair	fair	No	Erosion, exposed roots	2191482.507	6124514.089
25	<i>Quercus agrifolia</i>	Coast live oak	2	16	10							19	26	25	26	fair	fair	No	Erosion, old tag #46	2191507.748	6124532.562
26	<i>Quercus agrifolia</i>	Coast live oak	1	24								24	25	27	28	good	fair	No	Erosion, bee hive in base	2191500.275	6124546.644
27	<i>Quercus agrifolia</i>	Coast live oak	2	5	3							6	7	14	12	fair	fair	No	Erosion, exposed roots	2191545.086	6124611.637
28	<i>Quercus agrifolia</i>	Coast live oak	1	15								15	15	27	22	good	fair	No	Old tag #45	2191561.835	6124624.569
29	<i>Quercus agrifolia</i>	Coast live oak	1	9								9	11	23	15	fair	fair	No	Old tag #44	2191569.247	6124638.715
30	<i>Quercus agrifolia</i>	Coast live oak	1	25								25	26	24	24	poor	fair	No	Old tag #43	2191581.037	6124670.372
31	<i>Quercus agrifolia</i>	Coast live oak	2	16	13							21	27	30	30	fair	fair	No	Old tag #42	2191596.704	6124691.959
32	<i>Quercus agrifolia</i>	Coast live oak	2	12	9							15	17	22	26	fair	fair	No	Old tag #41	2191596.451	6124695.667
36	<i>Quercus agrifolia</i>	Coast live oak	1	9								9	10	24	14	fair	fair	No		2191618.489	6124707.58
37	<i>Quercus agrifolia</i>	Coast live oak	1	5								5	6	19	12	fair	good	No		2191633.021	6124711.56
39	<i>Quercus agrifolia</i>	Coast live oak	2	6	4							7	7	17	16	fair	fair	No		2191594.591	6124737.805
40	<i>Quercus agrifolia</i>	Coast live oak	2	44	15							46	55	40	60	fair	fair	No	Basal cavity	2191637.291	6124778.822
43	<i>Quercus agrifolia</i>	Coast live oak	2	5	4							6	9	21	12	good	good	Yes		2191769.88	6124845.017
44	<i>Quercus agrifolia</i>	Coast live oak	3	8	5	4						10	14	24	16	good	fair	No		2191640.853	6124717.526
52	<i>Quercus agrifolia</i>	Coast live oak	3	12	11	10						19	24	32	22	good	fair	No		2191696.811	6124770.901
53	<i>Quercus agrifolia</i>	Coast live oak	4	22	20	18	16					38	60	36	45	good	good	No	Erosion, exposed roots	2191753.014	6124807.975
54	<i>Quercus agrifolia</i>	Coast live oak	2	4	4							6	6	15	10	good	good	Yes		2191781.054	6124834.623
56	<i>Quercus agrifolia</i>	Coast live oak	1	6								6	8	24	14	good	good	Yes		2191778.706	6124845.057
57	<i>Quercus agrifolia</i>	Coast live oak	2	9	4							10	13	20	17	good	fair	No		2191797.548	6124843.834
58	<i>Quercus agrifolia</i>	Coast live oak	2	5	4							6	7	21	12	good	fair	No		2191804.1	6124847.974
61	<i>Quercus agrifolia</i>	Coast live oak	1	10								10	12	25	18	good	fair	No		2191812.968	6124862.879
62	<i>Quercus agrifolia</i>	Coast live oak	1	18								18	19	26	22	good	fair	No		2191844.74	6124894.099
68	<i>Quercus agrifolia</i>	Coast live oak	6	5	3	3	2	2	2			7	10	14	15	good	fair	No		2192004.024	6125153.347
69	<i>Quercus agrifolia</i>	Coast live oak	4	4	4	3	3					7	8	18	15	good	fair	No		2192001.476	6125169.273
70	<i>Quercus agrifolia</i>	Coast live oak	5	4	2	2	1	1				5	5	12	12	good	fair	No		2192009.661	6125249.913
72	<i>Quercus agrifolia</i>	Coast live oak	3	4	2	2						5	5	15	16	good	fair	No		2191986.56	6125181.674
75	<i>Quercus agrifolia</i>	Coast live oak	2	5	4							6	6	19	12	good	good	Yes		2191965.293	6125104.657
76	<i>Quercus agrifolia</i>	Coast live oak	4	5	4	3	2					7	9	21	16	good	good	Yes		2191968.411	6125105.303
78	<i>Quercus agrifolia</i>	Coast live oak	2	15	14							21	24	22	24	fair	fair	No	Old tag #37	2191740.027	6125022.963
79	<i>Quercus agrifolia</i>	Coast live oak	4	12	12	10	7					21	25	21	2	fair	fair	No	Old tag #38	2191745.213	6125010.906
80	<i>Quercus agrifolia</i>	Coast live oak	4	13	7	7	6					17	18	26	30	good	fair	No	Erosion, exposed roots	2192301.329	6125457.34
81	<i>Quercus agrifolia</i>	Coast live oak	2	7	6							9	12	18	16	good	fair	No	Basal wound	2192534.376	6125521.845
82	<i>Quercus agrifolia</i>	Coast live oak	1	11								11	13	19	18	good	good	Yes		2191842.532	6126657.499
98	<i>Quercus agrifolia</i>	Coast live oak	6	8	6	5	5	5	4			14	16	25	40	good	good	Yes		2194268.564	6126523.487
99	<i>Quercus agrifolia</i>	Coast live oak	5	8	8	5	5	4				14	18	15	18	good	good	Yes		2191060.056	6125234.976

*Trunk diameters are based on International Society of Arboriculture (ISA) standards. Individual trunk diameters are measured at 4.5 feet (54 inches) above natural grade. Trunk diameters for multiple stem trees equal the square root of the sum of all squared individual trunk diameters.

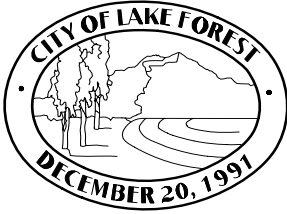
APPENDIX B

Tree Location Exhibit



APPENDIX C

Eucalyptus Tree Cutting Permit Application Form



Applicants Guide to Submitting for a **EUCALYPTUS TREE CUTTING PERMIT**

The City of Lake Forest is nestled within rolling hills, lakes and beautiful forests of eucalyptus trees. Our trees, however, currently are threatened by the activity of the Eucalyptus Longhorn Borer Beetle. During the restricted period, the beetle produces a large larvae population that thrives on exposed vegetation. These beetles lay their eggs on eucalyptus trees and their larvae bore holes within the trees causing serious damage and destruction.

Taking a few simple steps can control infestation of this beetle.

- Maintain your tree's health
- Report any sign of infestation to the City
- Cut or transport infected trees or logs only as permitted

A Eucalyptus Tree Cutting Permit must be obtained prior to cutting, pruning or removing any eucalyptus trees during the restricted period, April 1 through October 31. Due to the serious damage caused by the beetle during this period, permits will only be approved for emergency situations (i.e. trees are presenting a hazard or are destroying property).

ORDINANCE OVERVIEW

Chapter 6.20 REGULATIONS PERTAINING TO CONVERSION, MAINTENANCE AND REMOVAL OF EUCALYPTUS TREES

- No permit fee required
- Restricted period: April 1 – October 31
- Transportation or disposal of infected trees or logs only as permitted
- Violation may be a misdemeanor offense

PERMIT SUBMITTAL REQUIREMENTS AND PROCEDURES

1. Site plan indicating the number and location of eucalyptus trees to be pruned or removed on 8½" x 11" size paper with north arrow and title block indicating name, address and date of plan preparation;
2. Small scale vicinity map (Thomas Guide);
3. Written approval from Homeowner's or Business Association; and
4. Completed Eucalyptus Tree Cutting Permit Application Form

**Applications will not be deemed complete and accepted until all of the above items are included in submittal.*

The City of Lake Forest strongly encourages residents to take part in preserving our beautiful City. If you should have any further questions, please contact the Development Services Department at (949) 461-3400 or visit the City's web site at

<http://ci.lake-forest.ca.us>.



EUCALYPTUS TREE CUTTING PERMIT APPLICATION FORM

PERMIT NO. _____

25550 Commercentre Drive
Lake Forest, CA 92630
(949) 461-3400
Fax (949) 461-3512

<http://ci.lake-forest.ca.us>

Applicant (Check One)

- ☐ Homeowner's Association
☐ Resident of Lake Forest

Please complete the following information:

Property Address/Location: _____

Reason for eucalyptus tree cutting/removal (Please attach additional sheets if necessary):

Number of eucalyptus trees to be pruned/removed: _____

Proposed number of lots affected: _____

Proposed method of disposal: _____

Property Owner

Name: _____ Telephone: _____

Address: _____ Fax: _____

City: _____ State _____ Zip _____

Homeowner's or Business Association

Name: _____ Telephone: _____

Address: _____ Fax: _____

City: _____ State _____ Zip _____

Signatures

Important: I certify under penalty of perjury that all the foregoing information is true and correct and recognize that any false or misleading information shall be grounds for denying this application.

Name and Title of Applicant (please print): _____

Signature of Applicant: _____ Date _____

City Approval: _____ Date _____